(No Model.)

3 Sheets—Sheet 1.

J. CORNELIUS.

DITCHING MACHINE.

No. 478,408.

Patented July 5, 1892.

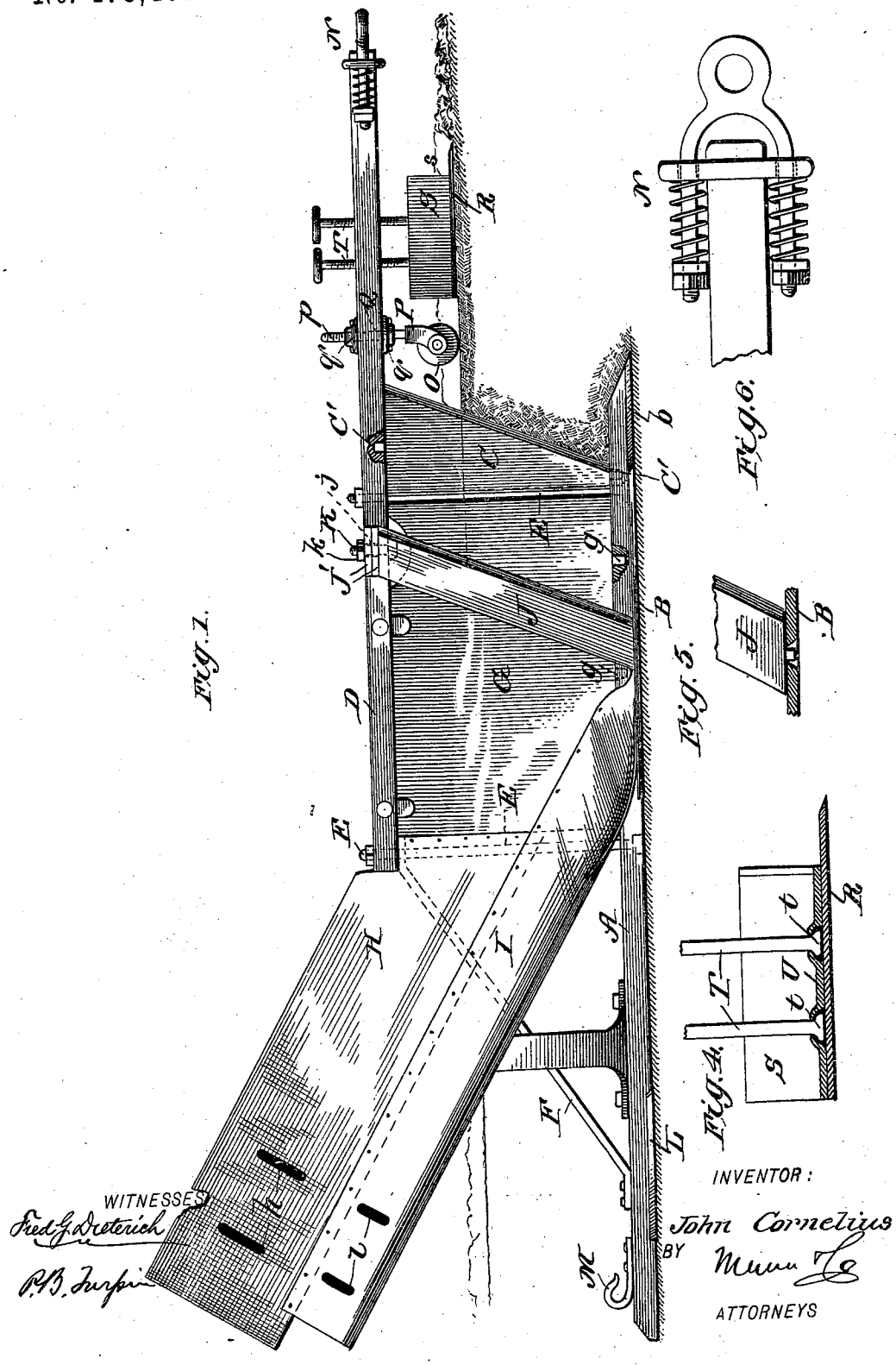

Fig. 1.

Fig. 6.

Fig. 5.

Fig. 4.

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P. B. Turpin

INVENTOR:

John Cornelius

BY Munn & Co

ATTORNEYS

(No Model.)

3 Sheets—Sheet 2.

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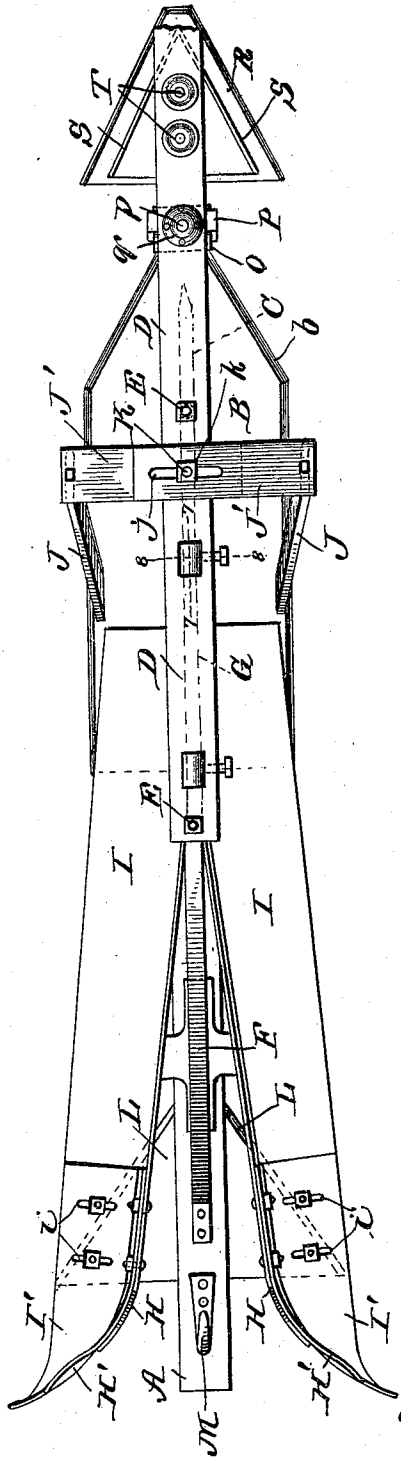

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

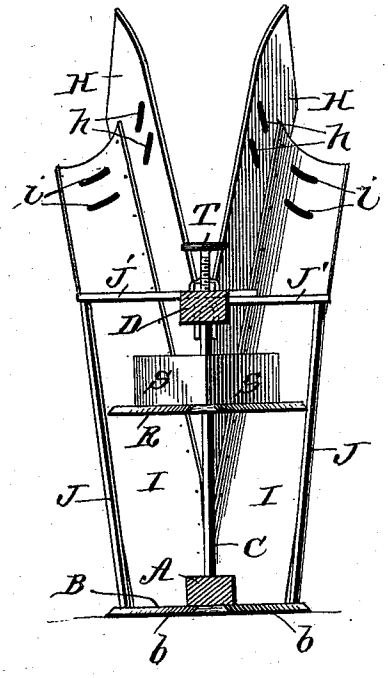


Fig. 7.

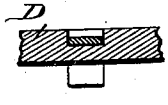
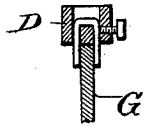


Fig. 8.



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INVENTOR:

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UNITED STATES PATENT OFFICE.

JOHN CORNELIUS, OF OAKLAND, MARYLAND.

DITCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,408, dated July 5, 1892.

Application filed April 5, 1892. Serial No. 427,958. (No model.)

To all whom it may concern:

Be it known that I, JOHN CORNELIUS, of Oakland, in the county of Garrett and State of Maryland, have invented a new and useful Improvement in Ditching-Machines, of which the following is a specification.

My invention is an improvement in ditching-machines, and has for its objects to provide a comparatively simple and inexpensive machine which may be used to cut ditches with parallel sides or with sides flaring outward and in which the machine will be held at the desired depth in the ground and be prevented from running out or going too deep.

The invention has for further objects other improvements; and it consists in novel features of construction and the combinations of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a side view; Fig. 2, a top plan view; Fig. 3, a front elevation; and Figs. 4, 5, 6, 7, and 8 are detail views.

In carrying out my invention I provide a sole-piece A, which at its front end is beveled off on its upper side down to an edge or point, as shown. To the under side of this sole-piece I secure the base-cutter B. This cutter extends from the front end of the sole-piece back for a considerable distance and is formed at its front end with the rearwardly-sloping sides or edges *b*, which are beveled off on their upper sides down to a cutting-edge. This formation of the cutting-edges *b* with the downward bevel at the front end of the sole serves to overcome a tendency of the machine to move up to the surface of the ground as it is pulled along, as the direction of beveling of the edges serves to force the point of the ditcher down into the ground, such tendency being resisted or counteracted by means of the gage-wheel, more fully described hereinafter. The intermediate central cutter C extends upward and inclines forward from the sole-piece and connects at its upper forward end with the top bar or beam D, the cutter C being provided at its ends with tenons or portions C′, fitted in sockets in the sole and beam. The sole and the beam are suitably connected and braced together, preferably by means of rods or bolts E and the strut-brace F, extending down from the rear end of the beam to the sole and firmly bolted to both such parts, as shown. The central cutter having its front cutting-edge inclined, as described, operates with a shearing action upon the soil and will readily cut through roots and similar obstructions.

The partition or dividing plate G is arranged in rear of the central cutter and is in the nature of a prolongation of such cutter, extending thence back to the turning plates presently described. This plate G has at its lower edge lugs *g*, fitting in sockets in the upper side of the sole, while at its upper edge it is held to the beam by clips dropped from the beam and lapping the opposite sides of the partition-plate. The turning-wings, of which I preferably use two at each side, an upper wing H and a lower wing I, incline upward from their juncture with the partition-plate, and the section H may have its extremity turned outward to throw the dirt to one side; but it is preferred to secure to the upper ends of both parts H and I outwardly-turning plates H′ and I′, secured to parts H and I by bolts passed through slots *h* and *i*, so that the plates H′ and I′ may be adjusted higher or lower, as desired.

The side cutters J are inclined at their front cutting-edges similarly to the central cutter and for a like reason, so they will cut the soil with a shearing action. At their lower ends the cutters J have tenons fitted in sockets in the base-cutter near the edge of the latter and are suitably held at their upper ends. It is preferred to support the upper ends of the side cutters by means of an adjustable support composed of two bars J′, sliding at their inner ends upon each other and connected at their outer ends with the side cutters, and a clamp for securing the bars in any suitable adjustment. This clamp is preferably a bolt K, passed through slots *j* in the bars J′ and receiving a nut *k*, as shown. By adjusting this support the side cutters may be set to cut vertical sides or sides sloped to any suitable angle.

To hold the rear end of the sole down and preserve the sole at the desired level, I provide a retaining-plate L, seated at its middle in and secured to the under side of the sole near its rear end. Such plate is sloped rearwardly and brought to a cutting-edge at its front end and projects laterally a distance

greater than the base-cutter. By this means the plate L at its outer ends cuts into the walls of the ditch and will positively prevent the rear end of the sole from rising. A hook M is secured to the sole near its rear end, so that draft mechanism may be hitched to pull the plow back when desired for any reason.

At its front end the beam has a suitable clevis N for the connection of the pulling or draft mechanism, such clevis being preferably provided with springs to ease the jar on the machine in case it strikes a large stone or other like obstruction. When such obstruction is met with, the machine may be pulled back slightly and then raised at its front end, so as to cause it to run over the obstruction, and after the obstruction is passed the machine may again be forced into the ground and proceed as before.

To regulate the depth of the machine, I provide the gage-wheel O. This wheel is made with a broad tread and is supported in a bracket P, the shaft or shank *p* of which turns through a threaded opening Q in the beam, so that the gage-wheel may be adjusted up or down, as desired. The opening Q is prolonged by means of nuts *q*, secured above and below the beam, with their threaded openings in register, so as to form a longer bearing for the shaft. This roller gages the depth of the ditch, and manifestly if the roller be left to follow the ground surface the bottom of the ditch will correspond with the unevenness of the ground surface. To avoid this difficulty, I provide a track-clearer for the gage-wheel, which cuts a level path for the same, so that the roller will at all times have a smooth flat bearing, insuring a smooth bottom for the ditch. This track-clearer is preferably constructed, as shown, with a base plate or cutter R, brought at its front end at the center to a point and sloping thence off on each side, and the side plates S, mounted on the said plate R and meeting at their front ends in a cutting-edge at *s*, and the support for such clearer, said support consisting of the two screw-shafts T, arranged one in rear of the other, bearing in threaded openings in the beam and swiveled at their lower ends to the base plate or cutter, preferably by forming heads *t* on the lower ends of the shafts T and fitting a cover or retaining-plate U upon the cutter-plate over the heads *t*, as shown. In this construction by raising one shaft T and lowering the other the angle of the track-clearer may be varied and set to cause its base-cutter to incline up or down toward its front end, and so operate to guide the ditcher up or down, as may be desired.

In operation the machine may be pulled by means of a pulling-machine, such as are used to pull stumps, or by any other suitable pulling or power mechanism.

It will be understood that the machine may be used to form tile-ditches, ditches for outlets, or other forms of ditches, as may be desired. In practice the front cutter-bar operates to split the dirt in the center, so that it may be equally divided and thrown half on each side.

Having thus described my invention, what I claim as new is—

1. In a ditching-machine, the combination, with the sole and the ditching-cutters, including a base-cutter, of a rear cutter-plate secured to the sole near the rear end thereof and extended laterally beyond the base-cutter, whereby to cut into the walls of the ditch, substantially as described, and for the purposes set forth.

2. In a ditching-machine, the combination, with the beam, the gage-wheel, and the ditching-cutters, of the track-clearer composed of a base plate or cutter, the side plates converging at their front ends, forming a cutting-edge, the supporting-shafts arranged one in rear of the other, threaded through the beam and having heads at their lower ends, and the cover-plate fitted on the said base-cutter and securing the heads of the shafts thereto, all substantially as set forth.

3. The improved ditching-machine herein described, consisting of the sole-piece, the beam, the adjustable gage-wheel, the adjustable track-clearer arranged in front of the gage-wheel, the base-cutter, the central cutter, the side cutters, the adjustable support for the said cutters, the partition in rear of the central cutter, and the turning-wings, all substantially as and for the purposes set forth.

4. An improved ditching-machine comprising the base beam or sole A, provided with the base-cutter, the top bar or beam D, the central cutter C, held between the beams A and D, the side cutters J, secured at their lower ends to the base-cutter, supports for the upper ends of the side cutters, said supports being fixed to the top beams, the partition-plate G, arranged in rear of and in alignment with the cutter C and held between the beams A and D, and the turning-wings connecting with the partition and base-cutter, all substantially as and for the purposes set forth.

5. In a ditching-machine, substantially as described, the combination of the central cutter, the base-cutter, the side cutters, and the elevating and turning wings located considerably in rear of the central cutter, of the partition-plate arranged in rear of and in alignment with said central cutter, the said partition being arranged at its front edge close to the rear edge of the central cutter and extending rearwardly therefrom to the turning-wings, all substantially as described, whereby well-defined slices may be formed and held separated before they are subjected to the action of the elevating and turning wings, substantially as set forth.

6. In a ditching-machine, the combination, with the base, central and side cutters and the beam, of the track-clearer, two independent vertically-adjustable supports arranged one in rear of the other and connecting the track-clearer with the beam, whereby said

clearer may be adjusted vertically and to any desired angle to the horizontal, and the gage-wheel adjustably supported and arranged in rear of the track-clearer, substantially as and for the purpose set forth.

7. In a ditching-plow, the combination, substantially as described, of the sole-piece or base, the ditching-cutters, including a base-cutter, the elevating and turning wings, and a cutter L, secured to the sole-piece in rear of the base-cutter, substantially as and for the purposes set forth.

JOHN CORNELIUS.

Witnesses:
KATIE CORNELIUS,
MARY WHITE.